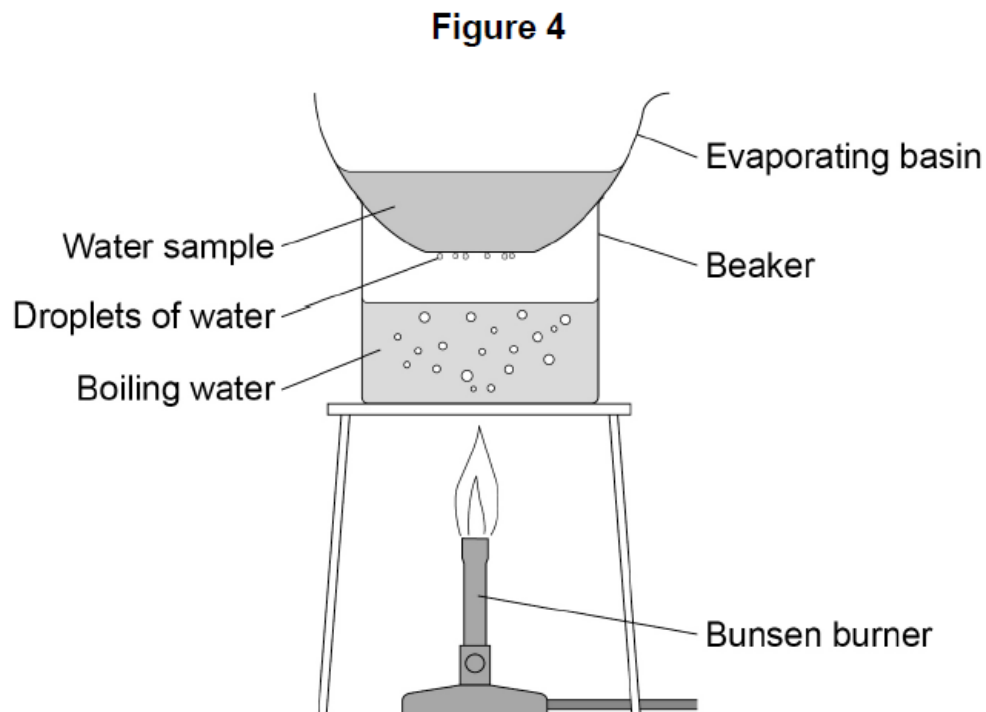


AQA - Using the Earth's resources and obtaining potable water – GCSE Combine Science Chemistry

1. *May/2020/Paper_8464/2F/No.3*

A student investigated the mass of dissolved solids in water samples.

Figure 4 shows the apparatus used.



This is the method used.

1. Record the mass of a dry evaporating basin.
2. Pour 25 cm³ of the water sample into the evaporating basin.
3. Place the evaporating basin on the beaker for 10 minutes.
4. Record the mass of the evaporating basin and contents.

What is used to find the mass of the evaporating basin?

[1 mark]

Tick (✓) **one** box.

Balance

Beaker

Measuring cylinder

Thermometer

One error is that droplets of water collect on the bottom of the evaporating basin.

Suggest how this error affects the mass of the evaporating basin and contents.

[1 mark]

How can this error be corrected?

[1 mark]

Another error in the method is that not all the water was removed from the water sample.

How can this error be corrected?

[1 mark]

Tick (✓) **one** box.

Add more boiling water to the beaker.

Heat until the mass of the evaporating basin and contents is constant.

Stir the water sample in the evaporating basin with a glass rod.

The water in the water sample turns into steam.

What is the name of this process?

[1 mark]

Another student did the experiment correctly with three water samples **A**, **B** and **C**.

Table 2 shows the results.

Table 2

Water sample	Mass of dissolved solids in g			
	Test 1	Test 2	Test 3	Mean
A	0.23	0.23	0.20	X
B	0.03	0.07	0.02	0.04
C	1.45	1.60	1.45	1.50

The range is the difference between the largest value and the smallest value.

Which water sample has the greatest range of results?

[1 mark]

Tick (✓) **one** box.

A

B

C

Calculate the mean mass **X** for water sample **A**.

Use **Table 2**.

[2 marks]

X = _____ g

What is the dependent variable in this experiment?

[1 mark]

Tick (✓) **one** box.

Mass of dissolved solids

Time taken for water to heat

Type of water sample

Volume of boiling water

A different water sample contains 3.6 g of dissolved solids in 150 cm³

Calculate the mass of dissolved solids in 25 cm³ of this sample.

[2 marks]

Mass = _____ g

2. May/2020/Paper_8464/2F/No.6

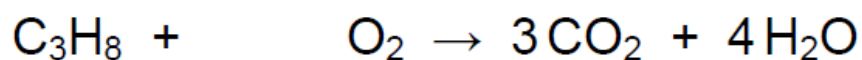
This question is about the Earth's resources.

When most fuels burn carbon dioxide is produced.

Propane (C₃H₈) is a fuel.

Balance the equation for the combustion of propane.

[1 mark]



Describe the test for carbon dioxide.

Give the result of the test.

[2 marks]

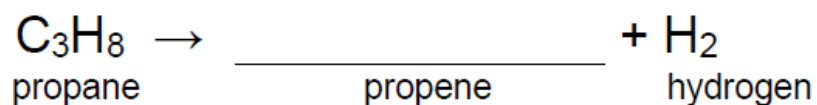
Test _____

Result _____

Propane can be cracked to produce propene and hydrogen.

Complete the symbol equation for the reaction.

[1 mark]



Describe the test for hydrogen.

Give the result of the test.

[2 marks]

Test _____

Result _____

Propene is an alkene.

Describe the test for alkenes.

Give the colour change in the test.

[3 marks]

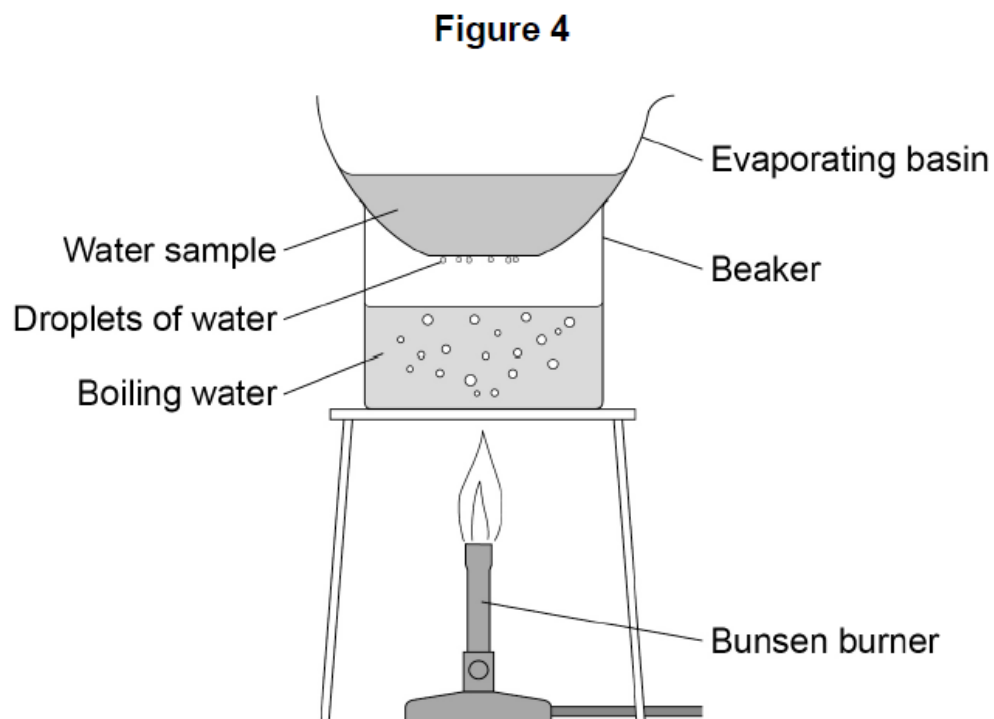
Test _____

Colour change _____ to _____

3. May/2020/Paper_8464/2H/No.4

A student investigated the mass of dissolved solids in four water samples **A**, **B**, **C** and **D**.

Figure 4 shows the apparatus used.



This is the method used.

1. Record the mass of a dry evaporating basin.
2. Pour 25 cm³ of water sample **A** into the evaporating basin.
3. Place the evaporating basin on the beaker for 10 minutes.
4. Record the mass of the evaporating basin and contents.
5. Repeat steps 1 to 4 with water sample **A** three more times.
6. Repeat steps 1 to 5 with water samples **B**, **C** and **D**.

What type of variable is the mass of dissolved solids?

[1 mark]

Tick (✓) **one** box.

Categoric

Control

Dependent

Independent

The method produced an error in the mass recorded in step 4.

Suggest what caused the error.

How could the error be avoided?

[2 marks]

Error _____

Avoided by _____

Another student carried out the investigation correctly.

Table 1 shows the results.

Table 1

Water sample	Mass of dissolved solids in g				
	Test 1	Test 2	Test 3	Test 4	Mean
A	0.22	0.23	0.20	X	0.21
B	0.03	0.08	0.02	0.03	0.04
C	0.45	0.60	0.49	0.58	0.53
D	0.80	0.91	0.79	0.86	0.84

Calculate value **X** in **Table 1**.

[2 marks]

X = _____ g

Which water sample has the greatest range of masses of dissolved solids?

Give the reason for your answer.

[2 marks]

Water sample _____

Reason _____

Water companies measure the volume of water used by households in cubic metres (m^3).

25 cm^3 of a different water sample contained 0.016 g of dissolved solids.

Calculate the mass of dissolved solid in 1 m^3 of this water sample.

$$1 \text{ m}^3 = 1000 \text{ dm}^3$$

Give your answer in standard form.

[4 marks]

Mass (in standard form) = _____ g

4. Jun/2019/Paper_8464/2F/No.6

Water that is safe to drink contains dissolved substances.

What do we call water that is safe to drink?

[1 mark]

Tick (✓) **one** box.

Desalinated

Filtered

Fresh

Potable

Describe a test for pure water.

Give the result of the test if the water is pure.

[2 marks]

Test

Result

Describe a method to determine the mass of dissolved solids in a 100 cm³ sample of river water.

[4 marks]

A sample of river water contains 125 mg per dm³ of dissolved solids.

Calculate the mass of dissolved solids in grams in 250 cm³ of this sample of river water.

Give your answer to 2 significant figures.

[4 marks]

Mass of dissolved solids = _____ g

A water company allows a maximum of 500 mg per dm^3 of sulfate ions in drinking water.

A sample of drinking water contains 44 mg per dm^3 of sulfate ions.

Calculate the percentage (%) of the maximum allowed mass of sulfate ions in the sample of drinking water.

[2 marks]

Percentage (%) of the maximum allowed mass = _____ %

5. Jun/2019/Paper_8464/2H/No.1

Water that is safe to drink contains dissolved substances.

What do we call water that is safe to drink?

[1 mark]

Tick (✓) **one** box.

Desalinated

Filtered

Fresh

Potable

Describe a test for pure water.

Give the result of the test if the water is pure.

[2 marks]

Test

Result

A water company allows a maximum of 500 mg per dm^3 of sulfate ions in drinking water.

A sample of drinking water contains 44 mg per dm^3 of sulfate ions.

Calculate the percentage (%) of the maximum allowed mass of sulfate ions in the sample of drinking water.

[2 marks]

Percentage (%) of the maximum allowed mass = _____ %